

REMARKS/ARGUMENTS

Claims 1-4 and 9-14 currently appear in this application. The Office Action of March 31, 2003, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Claims 1, 9, 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Rittmann et al.

This rejection is respectfully traversed. The filing date of Rittmann et al. is June 5, 2000. Submitted herewith is the declaration under 37 CFR 1.131 of Richard Smith, the inventor, declaring that he had conceived and reduced to practice the present invention prior to January, 2000, which is well before the Rittmann et al. filing date. It is respectfully submitted that Rittmann et al. is no longer a reference against the present application.

Claims 1, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rittmann et al. alone or further in view of Logan.

This rejection is respectfully traversed. In view of the Smith declaration under 37 CFR 1.131,

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Rittmann et al. has been removed as a reference. Logan merely discloses that hydrogen gas can be generated on site, but Logan is concerned with treating perchlorate-contaminated drinking water, not with removing nitrate from nitrate-contaminated water.

Claims 1 and 13 are rejected under 35 U.S.C. 103 as being unpatentable over Rittmann et al. in view of Logan or Montagnon.

This rejection is respectfully traversed. As Rittmann et al. is no longer a reference, the fact that Logan or Montagnon disclose passing water from a bioreaction treatment step through a sand filter is irrelevant.

Claims 1-4 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan in view of Yokomori. The Examiner states that Logan describes adding a nitrogen source to a contaminated groundwater stream recirculated through a solid-supported bioreactor comprising hydrogen-oxidizing *Proteobacteria*. Hydrogen gas produced electrolytically is said to be added to the column, after which the water is filtered through a sand filter. Yokomori is said to teach that ammonium nitrate is a conventional nitrogen source for bacterial reactions. Kaplan is cited to demonstrate that

Proteobacteria are purple, non-sulfur phototropic bacteria.

This rejection is respectfully traversed.

Logan provides a method for treating perchlorate-contaminated drinking water by filtering water through a filter bed containing perchlorate-reducing microorganisms. Logan describes the process at column 3, lines 15-29 in which perchlorate acts as an electron acceptor for respiration. An oxidizable substrate is also included in the bed to act as an electron donor for the microorganism. The substrate maintains the concentration of microorganisms by serving as a food source. Logan adds nitrogen, in the form of ammonium phosphate, as a nitrogen source for the bacteria.

Yokomori discloses that ammonium nitrate is a conventional nitrogen source for bacterial reactions.

In contrast thereto, the present invention is concerned with denitrification. That is, the present invention is concerned with removing nitrate from water contaminated with nitrate. Adding ammonium nitrate to the water to be treated would be contraindicated, as nitrate is the very ion the present invention removes from contaminated water. Moreover, in the present invention, as described on page 4, first paragraph, of the present specification, the bacteria used in the

present invention can grow and remain active in a hydrogen-fed bioreactor even when nitrate is not present and even after oxygen has been removed. Thus, it is clear that there is no motivation to add nitrate ion to the bioreactor of the present invention, as this would make the denitrification more difficult.

One reading Logan, which patent removes perchlorate from water and adds a source of nitrogen, in combination with Yokomori, which patent states that ammonium nitrate is a conventional nitrogen source for bacteria, would have absolutely no motivation to add nitrate ion to water which is already contaminated with nitrate ion.

As the Federal Circuit stated in *In re Lee*, 61 USPQ2d 1430 (January 18, 2002, Fed. Cir.), "As applied to the determination of patentability *vel non*, when the issue is obviousness, 'it is fundamental that rejections under 35 U.S.C. 103 must be based on evidence comprehended by the language of that section.' *In re Grasselli*, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000)... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See,

e.g., *McGinley v. Franklin Sports, Inc.*, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ('the central question is whether there is a reason to combine [the] references,' a question of fact drawing on the *Graham* factors.)

'The factual inquiry whether to combine references must be thorough and searching.' *Id.* This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). ('a showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential component of an obviousness holding"') (quoting *C. R. Bard, Inc. v. M3 Systems, Inc.* 48 USPQ2d (Fed. Cir. 1998)) The Court went on to quote *In re Dembiczaik*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999), "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."

There is a requirement for specificity in combining references, See, *In re Kotzab*, 55 USPQ2d 13134, 1317 (Fed. Cir. 2002) ("particular findings must be made as to the reason the skilled artisan, with no knowledge

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of the claimed invention, would have selected these components for combination in the manner claimed.").

In the present case, the Examiner has shown no motivation to combine the cited references to arrive at the particular invention claimed herein, but rather has shown motivation not to combine the references.

It is noted that USP 4337142 is cited as being of interest.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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